

### **Abstract of the Disclosure**

Techniques for generating a test set for hard to detect faults is disclosed. A set of hard to detect faults is identified. A test set for the hard to detect faults is generated by using an improved automatic test pattern generator. The improved automatic test  
5 pattern generator is adapted to consider hardware overhead and test sequence lengths, the hardware overheads being incurred when each new testcube is added to the test set. Parallel and serial type test per scan built-in self test circuits designed and adapted to use the disclosed improved automatic test pattern generator are  
10 also disclosed.